

NESC Update

Safety Directors Meeting

March 4, 2004

Larry Crawford

**NESC
Leadership Team/
NESC Review Board**

Office of the Director

Director - Ralph Roe
Deputy Director - Dr. Paul Munafo
Deputy Director for Safety - Larry Crawford
Chief Astronaut - Dr. Steve Hawley (JSC)
Chief Scientist - Dr. David Leckrone (GSFC)

LaRC

**Senior Safety and
Engineering Integration
Manager**

Tinsley, John

**NASA Chief Engineer
Representative**

Hudkins, Keith

**Management & Technical
Support Office**

Manager - Stan Newberry

LaRC

Systems Engineering Office

Manager – Ralph Roe (Acting)

LaRC

Ken Cameron
Clinton Cragg
Dr. Richard Gilbrech
Dr. Charles Harris

LaRC

NESC Chief Engineers Office

GRC - Derrick Cheston
ARC - Dr. Michael Freeman
SSC - Randy Galloway
LaRC - Dr. Michael Gilbert
GSFC - Michael Hagopian
JSC - David Hamilton
MSFC - Danny Johnston
DFRC - Michael Kehoe
JPL - Matt Landano (Acting)
KSC - Tim Wilson

NASA Centers

NESC Discipline Experts Office

GNC - Frank Bauer (GSFC)
NDE - Dr. Ed Generazio (LaRC)
Propulsion - George Hopson (MSFC)
Power & Avionics - Robert Kichak (GSFC)
Mechanical Analysis - Julie Kramer (Acting) (JSC)
Flight Sciences - Steve Labbe (Acting) (JSC)
Mechanical Systems - John McManamen (JSC)
Human Factors - Dr. Cynthia Null (ARC)
Materials - Dr. Robert Piascik (LaRC)
Structures - Dr. Ivatury Raju (LaRC)
Fluids/Life Support/Thermal - Henry Rotter (JSC)
Software - Steve Scott (GSFC)

NASA Centers

NESC Background Summary

- NESC became operational on November 1, 2003.
- NESC is staffed at 70% of the FY 04 compliment. All senior level managers of NESC have been filled. Vacant positions are being filled by detailed and temporary employees until permanent staffing is in place.
- NESC team members continue to develop operating procedures, including the initial review, formal risk assessment, and NESC review board discussion and approval of future independent assessments.
- Total of 22 support requests as of 2/19/04.
- NESC leadership established a formal NESC Review Board. This Board reviews potential assessment requests with formal discussions of a risk assessment and votes on which independent assessments the NESC will perform.

Types of Support Requests

- Assessment
 - Inspection
 - Consultation/Evaluation
 - Support
 - Dissenting Opinion
 - Mishap Investigation
 - Advocacy
 - Notification
 - Inquiry
-
- (One or more of these could involve independent testing)

NESC Pathfinder Activities

- o Space Shuttle Orbiter Rudder Speed Brake Actuator Braycote Grease – no major issue found and report is in work.
- o CALIPSO Propulsion System – 11 requirements established for the program office. The report was published 1/27/04 with briefings to Code Y and Q on 1/30/04.
- o X-43A aerodynamic concerns – NESC reviewing dissenting opinions and monitoring Flight Readiness Review process. NESC documentation should be complete by 2/28/04 in time to support a readiness decision.
- o Mars Exploration Rovers Flight Operations – NESC recommendations provided to the program in 12/03 and 1/04. Report is in work.

NESC Return to Flight Activities

Orbiter Rudder Speed Brake Actuator Gear Teeth Margins

- Identified during the NESC's assessment of grease degradation
- Interchanged gear discovered on OV-103 Actuator #4
- Assessing potential negative margins of interchanged gear and the effect of observed corrosion on gear structural integrity

Shuttle Flowliner

- Requested by Orbiter Project Manager
- Identifying the primary contributors to the cracking in the flowliner and develop a strategy to resolve the problem and/or mitigate risks to acceptable flight levels
 - Strategy will involve a detailed fracture mechanics analysis, a review of residual stresses, and development of improved methods or alternate methods for detecting flowliner cracks

NESC Recurring Anomaly Review

- Parallel reviews of Space Shuttle and International Space Shuttle Programs
- NESC will perform an independent review of Program rationale for identified recurring anomalies
 - Will rely on programs to perform data mining
 - For each potential area of concern, a request will be initiated and reviewed by the NESC Review Board
 - Assessment teams will be formed to address approved requests

NESC Recurring Anomaly Review(cont)

- Met with all of the Space Shuttle element teams to review data mining/analysis approach and status
- Initial areas of emphasis
 - Integrated anomalies
 - Recurring anomalies that should have been waived
- Innovative approaches and lessons learned will be shared across Review Teams
- Currently working on strategy to bring in contractors and consultants to support review and assessment teams

NESC SAFETY ACTIVITIES

Turn over DFRC job to others

Move from CA to VA

Create list of experts to draw SMA help to problem resolution teams & accident investigations

Form SMA Board (held two teleconferences)

Create Significant Problem Report Summary List

Assist hqs (D & Q) in developing and implementing policies in response to Diaz recommendations on anomaly reporting and trending

Offer advice on technical reports at NESC Board

continued

- Developed ideas and drafted WBS on how to improve SMA across agency
- Drafted hqs metrics for project risk levels across agency

Immediate Plans

- Mature contact list and SPR Summary List
- Formalize Board
- Drive SMA concerns to NESC Board
- Help SMA improve infrastructure(?)
- Help hqs get policies in place
- Understand state of trend analyses on Shuttle and Station
- Meet with system safety and reliability leads on top projects at centers to understand if we are working on right technical problems